Vidya Jyothi Institute of Technology

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Aziz Nagar Gate, C.B. Post, Hyderabad - 500 075

Department of Civil Engineering
R-18 Course Outcomes
B TECH - I YEAR I SEM

C101	Course Name: Mathematics I	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Write the matrix representation of system of linear equations and identify the consistency of the system of equations.	1
CO2	Find the Eigen values and Eigen vectors of the matrix and discuss the nature of the quadratic form.	4
CO3	Analyze the convergence of sequence and series.	4
CO4	Discuss the applications of mean value theorems to the mathematical problems, Evaluation of improper integrals using Beta and Gamma functions.	3
CO5	Examine the extrema of functions of two variables with/ without constraints.	5

C102	Course Name: Chemistry	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Acquire knowledge of atomic, molecular and electronic changes related to conductivity.	2
CO2	Apply the various processes of treatment of water for both domestic and industrial purpose.	3
CO3	Apply the knowledge of electrode potentials for the protection of metals from corrosion.	3
CO4	Analyze the major chemical reactions that are used in the synthesis of compounds.	4
CO5	Apply the knowledge of polymers in every day's life.	3

C103	Course Name: Chemistry Lab	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Analyze various water samples.	4
CO2	Determine the physical properties of lubricants.	5
CO3	Synthesize the organic compounds and analyze the inorganic salts.	4
CO4	Apply the knowledge of conductance and emf for estimation of strength of compounds.	3
CO5	Interpret the data to estimate the rate of reactions	2

Department of Civil Engineering
R-18 Course Outcomes

C104	Course Name: English	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Define vocabulary and grammar concepts for effective writing.	2
CO2	Classify and draw connections of ideas for technical and professional purposes	2
CO3	Interpret information into various forms of writing with the help of perfect syntax.	2
CO4	Organize the given texts and construct various written forms.	3
CO5	Relate values and elements of professionalism for successful careers.	3

C105	Course Name: English Language Skills Lab (ELSL)	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Recognise appropriate pronunciation and language fluency	4
CO2	Demonstrate accuracy to avoid ambiguity in pronunciation	2
CO3	Execute effective professional skills	5
CO4	Design a well-planned presentation for effective communication	6
CO5	Demonstrate confidence during job interviews	2

C106	Course Name: Programming for Problem Solving – I	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Design Algorithms and Flowcharts for real world applications using 'C'.	6
CO2	Know the usage of various operators in Program development.	2
CO3	Design programs involving decision and iteration structures.	6
CO4	Apply the concepts code reusability using Functions.	3
CO5	Analyze various searching and sorting techniques using Arrays.	4

C107	Course Name: Programming for Problem Solving Lab – I	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Apply the specification of syntax rules for numerical constants and variables, data types.	3
CO2	Know the Usage of various operators and other C constructs.	2
CO3	Design programs on decision and control constructs.	6
CO4	Develop programs on code reusability using functions.	6
CO5	Implement various searching and sorting techniques using arrays.	4

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C108	Course Name: Engineering Workshop	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Understand different tools used in engineering work shop practice	2
CO2	Perform various types of joints, filing, turning and house wiring operations	3
CO3	Test and Evaluate the accuracy of the operations performed	5
CO4	Understand different tools used in engineering work shop practice	2
CO5	Perform various types of joints, filing, turning and house wiring operations	3

Department of Civil Engineering
R-18 Course Outcomes
<u>B TECH - I YEAR I SEM</u>

C131	Course Name: Mathematics – II	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Classify the various types of differential equations of first order and first degree and apply the concepts of differential equations to the real-world problems.	2
CO2	Solve higher order differential equations and apply the concepts of differential equations to the real-world problems.	3
CO3	Find the Laplace Transform of various functions and apply to find the solutions of differential equations.	5
CO4	Evaluate the multiple integrals and identify the vector differential operators physically in engineering problems.	5
CO5	Evaluate the line, surface and volume integrals and converting them from one to another by using vector integral theorems.	5

C132	Course Name: Engineering Physics	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Interpret forced damped harmonic oscillations and Transverse waves.	3
CO2	Identify various optical phenomena of light.	2
CO3	Explain the working principle of optical fibers and lasers.	2
CO4	Describe the crystalline structures of solids.	4
CO5	Classify magnetic and dielectric behavior of materials.	2

C133	Course Name: Physics Lab	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Characterize the mechanical properties of given material.	2
CO2	Demonstrate various types of oscillation and rotational motion to determine the mechanical parameters.	2
CO3	Identify the magnetic induction along the axis of current carrying coil.	2
CO4	Apply the optical phenomena to characterize optical sources and components.	3
CO5	Describe the electrical characteristics LCR and RC circuits.	4

C134	Course Name: Engineering Mechanics	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Understanding the concepts of engineering mechanics	2
CO2	Apply the laws of mechanics for various engineering	3

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CO3	Analyze the motion of body.	4
CO4	Evaluate performance of various engineering components in terms of their energy capacities	5

C135	Course Name: Engineering Graphics & Modeling	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Understanding the concepts of engineering graphics with their applications.	2
CO2	Drawing the views of points, lines, planes and solids by Applying Ortho Graphic Projections.	6
CO3	Analyze the Sections and development of solids with various cutting planes.	4
CO4	Evaluating the 2D Graphic modeling with 3D models by using Auto Cad software.	5

C136	Course Name: English Communication Skills Lab (ECSL)	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Distinguish the variations in British and American English	2
CO2	Recognise the various purposes of listening and speaking	2
CO3	Interpret ideas in diverse communicative settings	3
CO4	Demonstrate confidence in public speaking skills	2
CO5	Develop new ideas in critical thinking, problem solving and decision-making skills and through GD's	6

C137	Course Name: Programming for Problem Solving - II	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Identify various string handling functions in 'C'.	2
CO2	Develop programs with user defined data types.	6
CO3	Use Dynamic memory allocation functions with pointers.	2
CO4	Distinguish between Stacks and Queues.	2
CO5	Analyze various Dynamic Data Structures.	5

C138	Course Name: Programming for Problem Solving Lab- II	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Build programs on various string handling functions.	6
CO2	Develop applications on user defined data types.	5
CO3	Apply dynamic memory allocation through pointers.	3
CO4	Implement linear data structures through stacks and queues.	3
CO5	Create linked list dynamically through stacks and queues	6

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B TECH - II YEAR I SEM

C201	Course Name: PROFESSIONAL COMMUNICATION	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Acquire enhanced personality	2
CO2	Exhibit appropriate professional etiquette	5
CO3	Practice team building with strong communication skills	2
CO4	Develop problem solving skills and decision-making	6
CO5	Demonstrate effective presentation skills	2

C202	Course Name: NUMERICAL METHODS AND PARTIAL DIFFERENTIAL EQUATIONS	Bloom's Taxonomy
CO	After learning the contents of course the students will be able to:	
CO1	Develop skills in solving engineering problems involving Algebraic and transcendental equations.	6
CO2	Acquires the knowledge of interpolation in predicting future out comes based on the present knowledge and also to fit different types of Curves.	3
CO3	Know the various types of numerical methods in solving engineering problems.	2
CO4	Classify the nature of second and Higher order partial differential equations and find the solutions of linear and non linear PDE.	2
CO5	Apply Partial differential Equations in different engineering problems.	3

C203	Course Name: FLUID MECHANICS	Bloom's Taxonomy
CO	After completion of this course students will be able to	
CO1	Understand the Concepts of fluid properties and the relationship between them and to obtain the principles of continuity, momentum, and energy as applied to fluid motions.	2
CO2	Differentiate various flow lines and to formulate the Continuity equation for One dimensional, Two dimensional and three dimensional flows.	4
CO3	Formulate the Euler's and Bernoulli's equation with practical applications, to determine the discharge over notches and weirs and to apply the Momentum equation for a pipe bend.	6
CO4	Evaluate the head losses in pipes, flow between parallel plates and to solve the pipe network problems.	5
CO5	Demonstrate Boundary layer concepts and to explain the separation of the boundary layer.	2

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C204	Course Name: SOLID MECHANICS – I	Bloom's Taxonomy
CO	Students who successfully complete this course will have demonstrated ability to:	
CO1	Examine stress – strain, elastic constants and strain energy.	4
CO2	Analyse the shear force and bending moment diagrams of beams and relationship between them.	4
CO3	Evaluate the flexural and shear stresses for various beam cross sections.	5
CO4	Calculate principal stresses and strains using analytical and graphical solutions for the safety using failure theories.	4
CO5	Determine the deflections of beams with various loadings using different methods.	5

C205	Course Name: ENGINEERING GEOLOGY	Bloom's Taxonomy
CO	Students who successfully complete this course will have demonstrated ability to:	
CO1	Classify and compare different rocks and minerals across the construction site.	2
CO2	Identify and build the knowledge on main and most common igneous, sedimentary and metamorphic rocks encountered by foundations and sites.	3
CO3	Define and Interpret the geological structures in the geological maps and cross sections	1
CO4	Understand the importance of graphical studies and various geophysical methods.	2
CO5	Illustrate the factors which affect the dams, reservoirs and tunnels.	4

C206	Course Name: SURVEYING & GEOMATICS	Bloom's Taxonomy
CO	Students who successfully complete this course will have demonstrated ability to:	
CO1	Perform a detailed surveying at any site by any method.	3
CO2	Use the modern survey equipment to measure angles and distances.	2
CO3	Measure the differences in elevation, draw and utilize contour plots, and calculate volumes	5
CO4	Develop applications of environmental remote sensing and GIS which can directly enhance service delivery on land use management, ground water management/prospects, agriculture, forestry, food and water security, disaster management, etc.	6
CO5	Avail the need for lifelong learning through the discussion of recent changes in survey procedures and equipment.	2

Department of Civil Engineering
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C207	Course Name: SURVEYING & GEOMATICS LAB	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Apply the principle of surveying for civil Engineering Applications	3
CO2	Calculation of areas.	5
CO3	Drawing plans and contour maps using different measuring equipment at field level	6
CO4	Learn the applications of GPS in surveying system	2
CO5	Write a technical laboratory report.	1

C208	Course Name: ENGINEERING GEOLOGY LAB	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	To study the physical properties and identification of minerals referred under the theory.	2
CO2	Describe and identify the rocks referred under the theory.	2
CO3	Illustrate the Microscopic study of rocks.	4
CO4	Interpret and draw the sections for geological maps showing tilted beds, faults, unconformities etc.,	4
CO5	Solve the simple structural geological problems.	6

C209	Course Name: ENVIRONMENTAL SCIENCE	Bloom's Taxonomy
CO	Students will be able to:	
CO1	Define and explain the structure and functions of ecosystem, value of biodiversity, threats and conservation of biodiversity.	1
CO2	Explain the limitations of the resources and impacts of over utilization of all natural resources.	2
CO3	Identify the sources and effects of environmental pollutions and list the available techniques to control the pollution.	3
CO4	Illustrate the global environmental issues like climate change, ozone hole and can explain the scope of EIA, Environmental Management Plan, environmental audit and list the EIA methods.	4
CO5	Mention the salient features of environmental acts and rules, define the sustainable goals along with measures required for the sustainability.	2

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B TECH - II YEAR II SEM

C231	Course Name: PROBABILITY AND STATISTICS	Bloom's Taxonomy
CO	After learning the contents of this course the students must be able to:	
CO1	Differentiate among random variables involved in the probability models which are useful for all branches of engineering.	4
CO2	Derive relationship among variety of performance measures using probability distributions.	6
CO3	Acquire elementary knowledge of parametric and non parametric –tests and understand the use of observing state analysis for predicting future conditions.	2
CO4	Identify and examine situations that generate using problems and able to solve the tests of ANOVA for classified data.	3
CO5	Apply proper measurements, Indicators and techniques of Correlation and regression analysis	3

C232	Course Name: PRINCIPLES OF ELECTRICAL ENGINEERING	Bloom's Taxonomy
CO	After this course the student can:	
CO1	Understand basics of electrical circuit components and their characteristics	2
CO2	Analyze the electrical circuits with A.C excitation	4
CO3	Understand the working principle and operation of transformers	2
CO4	Understand the fundamentals concepts of D.C Machines	2
CO5	Apply the concepts of the electrical engineering to design the low voltage electric installations	3

C233	Course Name: SOLID MECHANICS – II	Bloom's Taxonomy
CO	Students who successfully complete this course will have demonstrated ability to:	
CO1	Realize the basic concepts of torsion and locate the bending stress	2
CO2	Identify the types of columns and calculate the failure load for various end conditions	3
CO3	Understand the basic concepts of direct and bending stresses and calculate the bending moment	2
CO4	Differentiate about thin and thick cylinders and calculate the various stresses	4
CO5	Determine the stresses due to Unsymmetrical bending of beams and locate the shear	5

Department of Civil Engineering
R-18 Course Outcomes

C234	Course Name: ENVIROMENTAL ENGINEERING	Bloom's Taxonomy
CO	Students who successfully complete this course will have demonstrated ability to:	
CO1	Predict the population forecasting and test the quality of water.	4
CO2	Design the filter and apply disinfection practices for water treatment.	6
CO3	Design water distribution system and examine sewage.	6
CO4	Analysis and design sewerage system.	4
CO5	Design different units of sewage treatment plant and trickling filters.	6

C235	Course Name: STRUCTURAL ANALYSIS	Bloom's Taxonomy
CO	Students who successfully complete this course will be able to:	
CO1	Analyze propped cantilever, fixed beams for external loadings and support settlements.	4
CO2	Understand the concept of Slope deflection, moment distribution method and analysis of continuous beams.	2
CO3	Calculate the deflection of beams by different methods for determining slope and deflection and understand the concept of three hinged arches.	5
CO4	Analyze the pin-jointed plane frames.	4
CO5	Draw the influence line diagram for moving loads and calculate critical stress resultants.	6

C236	Course Name: BUILDING MATERIALS AND CONSTRUCTION TECHNIQUES	Bloom's Taxonomy
CO	At the conclusion of the course students will be able to:	
CO1	Identify the various building materials	3
CO2	Understand the minimum standard required to designate and use the material in construction.	2
CO3	Understand the uses of different material like concrete, masonry, wood, steel or with a combination of these materials in construction domain.	2
CO4	Describe various types of interior and exterior finishes.	3
CO5	Classify the various tests required for the building material.	3

Department of Civil Engineering
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C237	Course Name: ENVIRONMENTAL ENGINEERING LAB	Bloom's Taxonomy
CO	After the completion of the course student should be able to	
CO1	Understand principles and their practical application in water treatment.	2
CO2	Determine physical, chemical and biological characteristics of water and wastewater.	4
CO3	Determine the optimum dose of coagulant.	4
CO4	Estimate the chloride, nitrate and iron content in water.	5
CO5	Summarize the solutions using titration, conductivity meter, pH meter, turbidity meter and DO meter.	2

C238	Course Name: SOLID MECHANICS LAB	Bloom's Taxonomy
CO	At the end of the course the student will be able to:	
CO1	Predict the behavior of materials under impact, hardness, tensile and compressive loads.	6
CO2	Determine elastic constants by flexural and torsion test.	4
CO3	Determine the spring constants under various loadings.	4
CO4	Understand the deflection of materials under bending.	2
CO5	Understand basic material properties stress and strain	2

C239	Course Name: GENDER SENSITIZATION	Bloom's Taxonomy
CO	At the end of the course the student will be able to:	
CO1	Develop awareness about gender discrimination and take measurable steps to counter it.	5
CO2	Identify the basic dimensions of biological, sociological, psychological and legal aspects of gender.	3
CO3	Acquire knowledge about gendered division of labour in relation to politics and economics.	2
CO4	Enhance the knowledge and act against the gender violence.	3
CO5	Adapt the culture of work and live together as equals.	6

Department of Civil Engineering
R-18 Course Outcomes

B TECH - III YEAR I SEM

C301	Course Name: MANAGERIAL ECONOMICS & AND FINANCIAL ANALYSIS	Bloom's Taxonomy
CO	At the end of the course the students are expected to:	
CO1	Understand the importance of certain basic issues governing the business operations namely demand and supply, production function, cost analysis	2
CO2	Apply managerial tools and techniques in obtaining optimal solutions for business problems	3
CO3	Differentiate the various forms of business organizations	4
CO4	Evaluate and interpret the financial statements of companies using ratios	5
CO5	Apply the methods of capital budgeting in effective investment decision making.	3

C302	Course Name: DESIGN OF REINFORCED CONCRETE STRUCTURES	Bloom's Taxonomy
CO	Upon successful completion of this course students will be abe able to	
CO1	Understand the various design concepts and design a beam under flexure and draw the reinforcement details.	2
CO2	Design the beam under shear and torsion, Calculate the anchorage and development length and check the serviceability requirements for RC structural elements.	6
CO3	Analyze and solve various RC slabs and draw the reinforcement details	4
CO4	Classify short, long columns and draw the reinforcement details	3
CO5	Explore the design concept of footing & staircase.	2

C303	Course Name: GEOTECHNICAL ENGINEERING	Bloom's Taxonomy
CO	On successful completion of this course, it is expected that the students will be able to:	
CO1	Illustrate the soil formation and classification.s	4
CO2	Explain the Hydrostatic effect in soil mass.	2
CO3	Illustrate the stress distribution mechanism and compaction in soil mass.	4
CO4	Illustrate the mechanism of consolidation.	4
CO5	Identify the Shear strength parameters through analytical and experimental approach.	3

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R-18 Course Outcomes

C304	Course Name: CONCRETE TECHNOLOGY	Bloom's Taxonomy
CO	On completion of the course, the students will be able to	
CO1	Understanding the properties of cements and admixtures.	2
CO2	Analyse the properties of aggregates.	4
CO3	Evaluate the properties of fresh concrete.	5
CO4	Analyse the behavior of hardened concrete and durability of concrete.	4
CO5	Design the concrete mix using IS Code and describe the special concretes.	6

C305	Course Name: ADVANCED STRUCTURAL ANALYSIS (PE1)	Bloom's Taxonomy
CO	On successful completion of this course, it is expected that the students will be able to,	
CO1	Analyze the continuous beams, portal frames by Kani's method.	4
CO2	Differentiate Static and kinematic Indeterminacy of Trusses by Castiglione's second theorem.	4
CO3	Evaluate the shear forces and bending moments in Two-Hinged arches and to execute secondary stresses due to rise of temperature and Elastic Shortening of rib.	5
CO4	Analyze the Multi-storey frames by approximate methods for gravity (vertical) and horizontal loads.	4
CO5	Understand the concept of Matrix method for the analysis of continuous beams and Pin jointed plane frames	2

C306	Course Name: BUILDING PLANNING & DRAWING (PE1)	Bloom's Taxonomy
CO	On successful completion of this course, it is expected that the students will be able to,	
CO1	Identify various building components, conventional signs and symbols.	2
CO2	llustrate the building bye-laws and the principles of planning.	4
CO3	Understand about the building services and safety.	2
CO4	Design and Sketch the plans of various types of buildings and detailing of doors, windows, etc.	6
CO5	Understand the elements of perspective drawing involving simple problems.	2

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C307	Course Name: AIR POLLUTION AND CONTROL METHODS (PE1)	Bloom's Taxonomy
CO	On successful completion of this course, it is expected that the students will be able to,	
CO1	Find the sources, causes & effects of air pollution.	2
CO2	Understand the meteorological components and the plume behavior for atmospheric stability conditions.	2
CO3	Identify the types of equipments to control the particulates at sources.	3
CO4	Miniize the control measures of NOX, SOX and other gaseous emissions.	4
CO5	Examine the SPM, SOx, NOx and CO emission standards.	4

C308	Course Name: INTRODUCTION TO MICROCONTROLLERS (OE1)	Bloom's Taxonomy
CO	At the end of the course the students are expected to:	
CO1	Describe the architecture of 8051 with its special function registers.	3
CO2	Develop and analyze the programming concepts of 8051	4
CO3	Understand the various interfacing techniques pertaining to system design.	3
CO4	Express and infer advanced architectures using ARM Controllers.	2

C309	Course Name: BASIC ELECTRONICS (OE1)	Bloom's Taxonomy
CO	At the end of the course the students are expected to:	
CO1	Summarize the concepts of different semiconductor devices with its characteristics.	3
CO2	Describe the fundamental concepts and basic principle of meters.	4
CO3	Categorize different transducers and their working principles	3
CO4	Explain different bridges and understand how different physical parameters can be acquired.	2

Department of Civil Engineering
R-18 Course Outcomes

C310	Course Name: NON CONVENTIONAL ENERGY SOURCES (OE1)	Bloom's Taxonomy
CO	At the end of the course the students are expected to:	
CO1	Realize the importance of renewable energy sources for energy planning.	3
CO2	Understand the value of solar energy potential and exploit the solar energy for real world applications.	2
CO3	Understand the potential of wind energy, types of wind mills, performance characteristics and Betz criteria.	2
CO4	Analyze the potential of both tidal and ocean thermal energies and learn the extraction methods.	4
CO5	Know the potential of Geothermal, biomass energies and learn relevant extraction methods.	2

C311	Course Name: FUNDAMENTALS OF ELECTRICAL POWER GENERATION AND PROTECTION (OE1)	Bloom's Taxonomy
CO	At the end of the course the students will be able to:	
CO1	Understand the operation of Thermal power station through its schematic diagram.	2
CO2	Understand the arrangement of Hydro electric power station through its components.	2
CO3	Understand the various components of Nuclear power station	2
CO4	Understand the operation of Gas and Diesel power station through its schematic diagram.	2
CO5	Understand various power system protection components.	2

C312	Course Name: BASICS OF OPERATING SYSTEMS (OE1)	Bloom's Taxonomy
CO	At the end of the course the students are expected to:	
CO1	Understanding the operating system concepts and process management	2
CO2	Analyze process scheduling and synchronization.	4
CO3	Understand memory management concepts.	2
CO4	Illustrate File System implementation and Mass Storage Structure.	4
CO5	Analyze Deadlock mechanisms.	4

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C313	Course Name: CORE JAVA PROGRAMMING (OE1)	Bloom's Taxonomy
CO	At the end of the course the students are expected to:	
CO1	Understand OOP concepts to apply basic Java constructs	2
CO2	Analyze different forms of inheritance and handle different kinds of file I/O	4
CO3	Evaluate the usage of Exception Handling and Multithreading in complex Java programs	5
CO4	Contrast different GUI layouts and design GUI applications	3
CO5	Construct a full-fledged Java GUI application, and Applet with database connectivity	4

C314	Course Name: FUNDAMENTALS OF COMPUTER NETWORKS (OE1)	Bloom's Taxonomy
CO	At the end of the course the students are expected to:	
CO1	Understand the overview of reference models.	2
CO2	Classify and illustrate various sub protocols in multi access protocols.	2
CO3	Understand various routing algorithms and their operations.	2
CO4	Analyze transport protocols for the given scenario.	4
CO5	Identify the protocols and functionalities in application lay	3

C315	Course Name: TOTAL QUALITY MANAGEMENT (OE1)	Bloom's Taxonomy
CO	At the end of the course the students are expected to:	
CO1	Explore the quality framework in production and operational aspects.	2
CO2	Evaluate the role of quality in product design and analysis.	3
CO3	Analyze quality in process improvement and modern production management tools.	2
CO4	Explain the various types of Techniques are used to measure Quality.	5
CO5	Analyze the requirements of quality management system.	3

C316	Course Name: CAD LAB	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Assess the Software with aiding source.	2
CO2	Draft the Plan and Elevation & Sectional views of the buildings.	6
CO3	Develop the components of the building.	6
CO4	Replicate the detailing of framed and Industrial structures.	3
CO5	Interpret the isometric and orthogonal projection of buildings.	5

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C317	Course Name: ADVANCED COMMUNICATION SKILLS (ACS) LAB	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Develop sound communication skills in various situations with the help of enriched vocabulary.	3
CO2	Practice reading techniques for a faster and better comprehension.	4
CO3	Exhibit strong writing skills to express ideas effectively.	3
CO4	Demonstrate effective presentation skills.	2
CO5	Use appropriate verbal and non-verbal skills for a successful career.	1

C318	Course Name: QUANTITATIVE METHODS & LOGICAL REASONING	Bloom's Taxonomy
CO	At the end of the completion of the course a student is expected	
CO1	To perform well in various competitive exams and placement drives.	2
CO2	To solve basic and complex mathematical problems in short time.	4
CO3	To become strong in Quantitative Aptitude and Reasoning which can be applied for GRE, GATE, GMAT or CAT exam also.	3
CO4	To develop problem solving skills and analytical abilities, which play a great role in corporate and industry set up.	6
CO5	To perform well in various competitive exams and placement drives.	4

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B TECH - III YEAR II SEM

C331	Course Name: FOUNDATION ENGINEERING	Bloom's Taxonomy
CO	Upon successful completion of yhis course students will be able to:	
CO1	Organize the preparation and programme of soil investigation.	2
CO2	Examine the earth pressure theories and stability of retaining walls.	5
CO3	Evaluate the bearing capacity of soil and allowable settlement.	5
CO4	Analyse the capacity and settlement of pile foundation.	4
CO5	Analyse the stability of finite and infinite slopes using various methods.	4

C332	Course Name: DESIGN OF STEEL STRUCTURES	Bloom's Taxonomy
CO	Upon successful completion of this coursestudentswill be able to do:	
CO1	Classify the types of connections and specifications as per IS: 800-2007.	2
CO2	Apply the provisions of IS: 800-2007 to design tension members.	3
CO3	Analyze and design compression members.	4
CO4	Illustrate behaviour of beams and design strengths as per IS code.	4
CO5	Adapt IS code procedures to design welded plate girder.	6

C333	Course Name: HYDRAULICS & HYDRAULIC MACHINERY	Bloom's Taxonomy
CO	At the end of this course, students will be able to	
CO1	Explain the concept of different types of flows, designing of most Economical section of open channel & to understand the concept of specific energy.	2
CO2	Demonstrate the concept of dimensional quantities and the application of similitude concepts in designing a model and prototype.	2
CO3	Understand the concept, working applications of impact of jets with the importance of Constructing velocity triangles.	2
CO4	Compare the design concept of Pelton, Francis and Kaplan turbines, Centrifugal pumps along with the most economical designs.	4
CO5	Determine the working mechanism of different types of the pumps with their important characteristic curves.	5

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C334	Course Name: WATER RESOURCES ENGINEERING	Bloom's Taxonomy
CO	Upon successful completion of this coursestudentswill be able to do:	
CO1	Describe the components in the hydrologic cycle and all hydrological processes and methods.	2
CO2	Analyze the flood analysis and its measurement by means of hydrograph.	4
CO3	Analyze the phenomenon of Ground water occurrence by means of aquifers.	4
CO4	Assess the methods of irrigation and its quality with help of duty delta relationship.	5
CO5	Design the canals by using standard theories.	6

C335	Course Name: CONSTRUCTION ENGINEERING &MANAGEMENT (PE2)	Bloom's Taxonomy
CO	Upon successful completion of this course students will be able to:	
CO1	Understand the behavioural aspect of entrepreneurs, various approaches of time management, their strength and weakness.	2
CO2	Apply the concepts of project management during the construction phase, project organization, project planning and control using CPM,PERT techniques.	2
CO3	Analysis various materials and equipment's for construction work.	4
CO4	Examine the on different types of contracts and specifications.	5
CO5	Outline the labour regulations and safety in construction.	2

C336	Course Name: GROUND IMPROVEMENT TECHNIQUES (PE2)	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Illustrate the several Ground modification mechanisms	4
CO2	Illustrate the Ground Improvement Techniques through mechanical approach.	4
CO3	Identify the different Hydraulic ground improvement techniques through Dewatering techniques.	2
CO4	Explain the quick settlement techniques through chemical and physical modification.	2
CO5	Distinguish the inclusion and confinement techniques of ground improvement.	4

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C337	Course Name: FINITE ELEMENT METHOD (PE2)	Bloom's Taxonomy
CO	Upon successful completion of this course students will be able to	
CO1	Explain plane stress-plane strain equations and develop displacement functions.	2
CO2	Analyze one-dimensional problems using stiffness matrix.	4
CO3	Examine the different elements based on continuity and compatibility.	4
CO4	Illustrate quadrilateral elements using nodal points and shape functions.	4
CO5	Determine displacements, strains and stresses for static loads.	5

C338	Course Name: Fundamentals of Nano Science Technology (OE2)	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Understand the fundamental concepts of Nano science and Technology	2
CO2	Select appropriate synthesis route for production of different nanostructures.	2
CO3	Describe principles of operation and uses of various characterization techniques	3
CO4	Analyze the properties of nanomaterial's	4
CO5	Apply the Nanostructures for various engineering applications.	3

C339	Course Name: Principles of Electric Power Utilization (OE2)	Bloom's Taxonomy CO
CO	At the end of this course the student will be able to	
CO1	Understand terms and concepts of illumination	2
CO2	Apply the concepts of different electric lamps and good lighting Practices for artificial lighting systems.	3
CO3	Understands the methods of electric heating and welding	2
CO4	Understands the concepts of different electric traction systems and existing traction system in India.	2
CO5	Analyze the mechanics of train movement	4

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C340	Course Name: Energy Auditing and Conservation (OE2)	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Realize the need for energy auditing and conservation. Get awareness on types of energy audit; represent energy flows and energy consumption in tabular and graphical methods.	3
CO2	Understand and exploit energy saving opportunities in energy efficient motors and power factor improvement methods.	2
CO3	Learn energy auditing and conservation opportunities in HVAC systems with respect to energy efficient buildings.	1
CO4	Analyze the economic viability with respect to real world problems using depreciation methods.	4
CO5	Know the check lists for energy conservation in boilers, heat pumps, cooling systems, compressors and fans.	2

C341	Course Name: Fundamentals of Embedded Systems (OE2)	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Contrast the basics of embedded system with its application	4
CO2	Illustrate the components required for embedded system design.	3
CO3	Summarize the different development tool for embedded system	2
CO4	Relate the concepts of RTOS in real time programming	1
CO5	Outline the features of advanced buses of distributed data transfer system design.	3

C342	Course Name: Principles of Communications (OE2)	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Understanding the fundamentals of communications	3
CO2	Summarize the different modulation techniques involved in analog Communication	2
CO3	Summarize the different modulation techniques involved in digital Communication	2
CO4	Identify the applications of various wired and wireless communications in real time.	3
CO5	Elaborate the fundamentals of satellite and optical communications.	2

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C343	Course Name: Database Management Systems (OE2)	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Design Entity-Relationship Model for enterprise level databases.	5
CO2	Develop the database and provide restricted access to different users of database and formulate the Complex SQL queries.	2
CO3	Analyze various Relational Formal Query Languages and various Normal forms to carry out Schema refinement.	4
CO4	Use of suitable Indices and Hashing mechanisms for real time implementation.	3
CO5	Analyze various concurrency control protocols and working principles of recovery algorithms	4

C344	Course Name: Software Engineering (OE2)	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Choose a process model to apply for given project requirements	2
CO2	Analyze and apply the framework activities for a given project	4
CO3	Design various system models for a given scenario	5
CO4	Design and apply various testing techniques	5
CO5	Understand metrics for Process and Products	3

C345	Course Name: Financial Institutions & Markets (OE2)	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Explore Indian investment environment.	3
CO2	Evaluate available investment avenues.	5
CO3	Analyze the role of regulatory bodies in the Indian Financial system.	4
CO4	Identify recent trends and challenges in Indian banking sector	2

C346	Course Name: GEOTECHNICAL ENGINEERING LAB	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Demonstrate the engineering properties the soil.	2
CO2	Illustrate the field bulk and dry density of cohesive and cohesion less soils.	4

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CO3	Classify the Coarse grained soils based on sieve analysis test & a grain size distribution curve.	**2**
CO4	Compute the shear strength of cohesive and cohesion less soil.	**2**
CO5	Determine the permeability of coarse grained soil and fine grained soil by constant head permeability test and falling head method.	**5**

C347	**Course Name: FLUID MECHANICS & HYDRAULIC MACHINERY LAB**	**Bloom's Taxonomy**
CO	Students who successfully complete this course will have demonstrated ability to:	
CO1	Describe the basic measurement techniques of fluid mechanics and its appropriate application.	**2**
CO2	Interpret the results obtained in the laboratory for various experiments.	**5**
CO3	Discover the practical working of Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.	**3**
CO4	Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.	**2**
CO5	Write a technical laboratory report	**1**

C348	**Course Name: PERSONALITY DEVELOPMENT AND BEHAVIORAL SKILLS**	**Bloom's Taxonomy**
CO	At the end of the completion of the course a student is expected-	
CO1	Practice optimistic attitude for an efficient, socially viable and multi-faceted personality.	**2**
CO2	Demonstrate functions of non-verbal communication in formal context.	**2**
CO3	Build effective individual & team dynamics for professional accomplishments.	**3**
CO4	Analyze appropriate strategic Interpersonal Skills for productive workplace relationships.	**4**
CO5	Correspond in multiple contexts, for varied audiences, across genres and modalities.	**5**

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R-18 Course Outcomes
B TECH - IV YEAR I SEM

C401	Course Name: HIGHWAY ENGINEERING	Bloom's Taxonomy
CO	At the end of this course the student will be able to	
CO1	Summarize the road developments in India from different periods.	2
CO2	Apply the concept of geometric design in real time engineering.	3
CO3	Make use of parameters related to traffic studies.	3
CO4	Design & model the intersections with specific standards.	6
CO5	Evaluate the different pavement design methods using IRC standards.	5

C402	Course Name: ESTIMATION & COSTING	Bloom's Taxonomy
CO	After completion of the course, student can be able to	
CO1	Summarize the basic principal and standard methods for working out quantities in estimating.	2
CO2	Determine the earthwork estimate of buildings, roads and canals.	5
CO3	Estimate the rate analysis of the various items of work.	2
CO4	Understand the process of contracting for roads and buildings.	2
CO5	Evaluate the valuation of buildings and provide practical knowledge of standard specifications of items of building construction.	5

C403	Course Name: PRESTRESSED CONC1RETE STRUCTURES (PE3)	Bloom's Taxonomy
CO	After completion of the course, student can be able to	
CO1	Classify the concepts, principles, types and methods of PSC structures.	3
CO2	Evaluate the losses of PSC structures.	5
CO3	Analysis and design of PSC slabs and beams using IS:1343 (2012).	4
CO4	Explain transmission of prestressing force, end block analysis by different methods.	2
CO5	Analyse the stress distribution of composite beams and asses the deflection of beams.Understand the different methods of prestressing.	4

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C404	Course Name: EARTHQUAKE ENGINEERING (PE3)	Bloom's Taxonomy
CO	After completion of the course, student can be able to	
CO1	Quantify mechanical behaviour of earth's surface, seismic hazards and its effects.	4
CO2	Identify, formulate and solves engineering problems subjected to dynamic loading conditions.	2
CO3	Understand the internal parameters of the structures for seismic design source.	2
CO4	Assess the design component or process to meet desired needs within realistic constraints.	5
CO5	Analyze and design the members for earthquake resisting parameters.	4

C405	Course Name: GREEN BUILDING TECHNOLOGIES (PE4)	Bloom's Taxonomy
CO	After successful completion of this course the students should able to	
CO1	Understanthe Green building concept and focus on approaches that makes building sustainable.	2
CO2	Illustrate Green building assessment and accreditation system.	4
CO3	Apply low energy building strategies.	3
CO4	Designing green building and improve sustainability of infrastructure.	6
CO5	Classify the economic benefits of green buildings.	3

C406	Course Name: RAILWAYS, AIRPORTS AND HARBORS ENGINEERING (PE4)	Bloom's Taxonomy
CO	Upon successful completion of yhis course students will be able to:	
CO1	Define and understand the various components of railways.	2
CO2	Understand and solve the geometric elements needed for the design of permanent way.	2
CO3	Define, understand, and design the various components of the airport.	5
CO4	Define, understand the planning and requirements of a harbor.	4
CO5	Improve and Visualize the working of intelligent transportation system.	3

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C407	Course Name: ADVANCED STRUCTURAL DESIGN (PE4)	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Analyze and design of cantilever retaining wall.	4
CO2	Apply the provision of IS :3370-2009 to design water tank.	3
CO3	Apply the provision of IS 456-2000 for designing flat slab.	3
CO4	Adapt the provision of IRC 21-1987 to class AA loading to design T beam girder.	2
CO5	Summarize the force components and design principles of RCC Chimney.	2

C408	Course Name: GROUND WATER HYDROLOGY (PE4)	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Understand different types of aquifers and their characteristics	2
CO2	Analysis the pumping test data for different aquifers	4
CO3	Distinguish the surface and subsurface investigation methods of ground water.	4
CO4	Discuss the methods of artificial recharging of ground water.	2
CO5	Evaluation and control of saline water intrusion.	5

C409	Course Name: GROUND WATER HYDROLOGY (PE4)	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Understand different types of aquifers and their characteristics	2
CO2	Analysis the pumping test data for different aquifers	4
CO3	Distinguish the surface and subsurface investigation methods of ground water.	4
CO4	Discuss the methods of artificial recharging of ground water.	2
CO5	Evaluation and control of saline water intrusion.	5

C410	Course Name: Introduction to Mat Lab (OE3)	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Breakdown computational problems into a series of simple steps.	4
CO2	Create programs in the MATLAB language for engineering applications.	6
CO3	Apprise and get familiarized with the visualization techniques.	3
CO4	Formalized with different application tools required different area of the domain.	3
CO5	Expose to the most common algorithms and techniques that are	4

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	the Building blocks of Mat lab	

C411	**Course Name: Circuit Simulation using PSPICE (OE3)**	**Bloom's Taxonomy**
CO	At the end of the course, the student will be able to:	
CO1	Describe circuits for PSpice simulation	2
CO2	Outline the types of DC TO AC and their output variable analysis.	2
CO3	Understand the response of transient analysis and obtain their output variable	2
CO4	Analyze and develop simulation circuit for different applications	4

C412	**Course Name: Electrical & Hybrid Vehicles (OE3)**	**Bloom's Taxonomy**
CO	At the end of the course, the student will be able to:	
CO1	Understand the components of electric vehicles and fundamentals of electric vehicles.	2
CO2	Summarize the types of batteries and principles of operation of Batteries.	2
CO3	Perceive the basic principles of electric motors which can be used in electric vehicles	3
CO4	Restate the transmission of the drive system and the components of the transmission.	2
CO5	Outline the concepts of hybrid vehicles and analyze the performance of hybrid vehicles.	2

C413	**Course Name: Energy Storage Systems (OE3)**	**Bloom's Taxonomy**
CO	At the end of the course, the student will be able to:	
CO1	Perceive the Electrical Energy Storage Technologies.	2
CO2	Understand the needs of electric energy storage	2
CO3	Analyze the characteristics and features of energy from various sources.	4
CO4	Classify various types of energy storage and various devices used for the purpose.	2
CO5	Apply the same concepts to real time solutions like electric vehicles, smart Grid and SCADA etc.	3

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C414	Course Name: Information System for Engineers (OE3)	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Understand the concepts of Information Systems.	2
CO2	Evaluate the design, development and security of Information Systems	5
CO3	Analyze the various modules in social issues while using Information Systems.	4
CO4	Analyze the issues in data security	4
CO5	Analyze the concept of ethics in information systems.	4

C415	Course Name: Web Design (OE3)	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Create static web pages using HTML	6
CO2	Design styles for HTML web pages	5
CO3	Create interactive web pages using Javascript	6
CO4	Develop web applications using server side scripting language-PHP	3
CO5	Develop and analyze web applications with Java Server Pages	4

C416	Course Name: Fundamentals of Entrepreneurship (OE3)	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	
CO1	Provide awareness about entrepreneurship	3
CO2	Develop idea generation, creative and innovative skills among students	6
CO3	Self-motivate the students by making aware of the different opportunities by exploring themselves by discussing the successful growth/failure stories	2
CO4	Start an enterprise and design business plans are those suitable for funding by considering all dimensions of business.	2

C417	Course Name: CONCRETE & HIGHWAY MATERIALS LAB	Bloom's Taxonomy
CO	At the end of the course, the student will be able to:	

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CO1	Examine the experimental strength of aggregate materials as per codal provisions.	**4**
CO2	Illustrate the stability & properties of bituminous materials & mixes by conducting tests.	**4**
CO3	Determine the properties of cement by conducting the test.	**5**
CO4	Define the workability of fresh concrete by conducting tests.	**1**
CO5	Estimate the strength of hardened concrete by conducting destructive and non destructive testing.	**5**

C418	**Course Name: COMPUTATIONAL LAB**	**Bloom's Taxonomy**
CO	At the end of this course the student will be able to	
CO1	Encalcate with the usage of recent softwares and its applications in the field of civil engineering	**3**
CO2	Analysing the Beam and Slab using Staad Pro software.	**4**
CO3	Assess the frame using the Staad Pro.	**5**
CO4	Model & demostraing the slope of the soil source using Geostudio.	**3**
CO5	Analysis the settlement of footing and pile using geostudio.	**4**

C419	**Course Name: INDUSTRIAL ORIENTED MINI PROJECT**	**Bloom's Taxonomy**
CO	The student will be able to:	
CO1	Interpret the literature and develop solutions for framing problem statement.	**5**
CO2	Select software techniques for identifying problems.	**3**
CO3	Analysis and test the modules of planned project.	**4**
CO4	Design technical report and deliver presentations.	**6**
CO5	Apply engineering and management principles to achieve project goals.	**3**

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B TECH - IV YEAR II SEM

C431	Course Name: REHABILITATION AND RETROFITTING OF STRUCTURES	Bloom's Taxonomy
CO	Upon successful completion of yhis course students will be able to:	
CO1	Understand the causes and prevention of deterioration in structures.	2
CO2	Identify the types of damages and the mechanisms of corrosion in steel reinforcement and fire induced damages.	3
CO3	Examine to inspect and assess the structures using techniques of visual inspection and NDT.	5
CO4	Estimate the structural damage and recommend suitable repair and strengthening methods.	5
CO5	Apply the latest health monitoring and building instrumentation methods.	3

C432	Course Name: REMOTE SENSING & GIS	Bloom's Taxonomy
CO	After successful completion of this course the students should able to:	
CO1	Understand the concepts of Photogrammetry and compute the heights of the objects using parallax.	2
CO2	Understand the principles of aerial Photogrammetry and remote sensing, Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies.	2
CO3	Analyze the basic concept of GIS and its applications, able to work with GIS software in various application fields.	3
CO4	Illustrate spatial and non-spatial data features in GIS and understand the map projections and coordinate systems.	4
CO5	Understand the application of vector and raster data structure to the real world, the importance of source map and learning the on-screen digitization.	2

C433	Course Name: TECHNICAL SEMINAR	Bloom's Taxonomy
CO	The student will be able to:	
CO1	Demonstrate the skills in identifying, analysing, and presenting a research topic.	3
CO2	Demonstrate the quality of knowledge gained from the literature survey on recent technologies.	3
CO3	Demonstrate the skills developed to communicate effectively on engineering activities with the engineering community.	4

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CO4	Demonstrate ability to effectively manage time in presentation skills.	3
CO5	Design a technical report with the principal of ethics.	6

C434	Course Name: COMPREHENSIVE VIVA VOCE	Bloom's Taxonomy
CO	The student will be able to:	
CO1	Explain comprehensively to answer questions from all the courses.	2
CO2	Test Oral Presentation skills by answering questions in a precise and concise manner.	5
CO3	Build confidence and interpersonal skills.	3
CO4	Support the students to face interview both in the academic and the industrial sector.	2
CO5	Improve placements and better performers in their future.	5

C435	Course Name: MAJOR PROJECT	Bloom's Taxonomy
CO	The student will be able to:	
CO1	Identity, Analyse and apply suitable current techniques and tools to solve a problem in the civil engineering domain and societal issues.	4
CO2	Function effectively in teams to accomplish a common goal.	4
CO3	Organise the technical report writing and communication effectively.	6
CO4	Extend in lifelong activity.	3
CO5	Define and analyse a problem to assess health, safety and legal issues	4